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मानक

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“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 10717 (1983): Conventional representation of gears on technical drawings [PGD 24: Drawings]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard



CONVENTIONAL REPRESENTATION OF
GEARS ON TECHNICAL DRAWINGS
(ISO Title : Technical Drawings — Conventional
Representation of Gears)

National Foreword

This Indian Standard, which is identical with ISO 2203-1973 'Technical drawings — Conventional representation of gears' issued by the International Organization for Standardization (ISO), was adopted by the Indian Standards Institution on recommendation of the Drawings Sectional Committee and approved by the Engineering Division Council.

IS : 696-1972 'Code of practice for general engineering drawing (*second revision*)' was originally issued in 1955 and was revised in 1960 as a consequence of changeover to the metric system of weights and measures. The second revision of IS : 696 was carried out in 1972 to bring it more in line with the recommendation published by the Technical Committee TC 10 — Technical Drawing of the International Organization for Standardization.

ISO has published number of standards on various subjects covered in IS : 696-1972. This standard is an adoption of ISO 2203-1973 on the subject superseding the relevant subject matter covered in Table 3.3 of IS : 696-1972.

Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'.

Drawings Sectional Committee, EDC 20; Drawing Subcommittee, EDC 20 : 1 [Ref: Doc : EDC 20 (4082)]

Adopted 16 August 1983

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1 SCOPE AND FIELD OF APPLICATION

This International Standard establishes the conventional representation of the toothed portion of gears including worm gearing and chain wheels. It is applicable to detail drawings and assembly drawings.

As a fundamental principle a gear is represented (except in axial section) as a solid part without teeth, but with the addition of the pitch surface in a thin long chain line.

NOTE — For uniformity all figures in this International Standard are in first angle projection (Method E). It should be understood that the third angle projection (Method A) could equally well have been used without prejudice to the principles established.

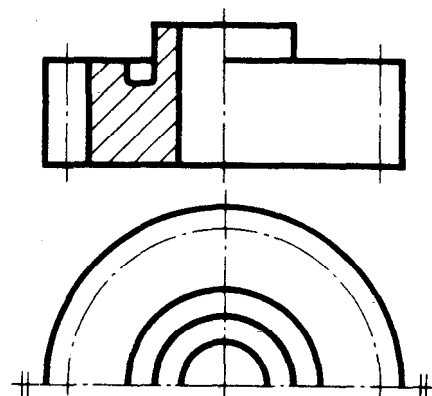


FIGURE 1

2 DETAIL DRAWINGS (INDIVIDUAL GEARS)

2.1 Contours and edges

Represent the contours and the edges of each gear (see Figures 1, 2 and 3), as if they were,

- in an unsectioned view, a solid gear bounded by the tip surface;
- in an axial section, a spur gear having two diametrically opposed teeth, represented unsectioned, even in the case of a gear that does not have spur teeth or that has an odd number of teeth.

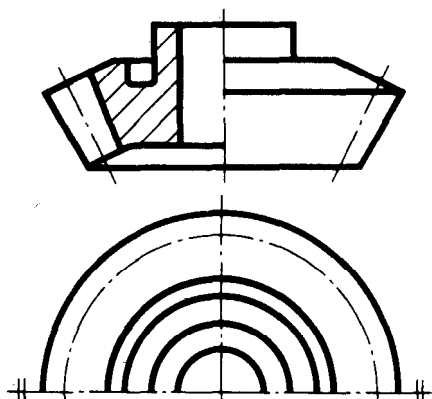


FIGURE 2

2.2 Pitch surface

Draw the pitch surface with a thin, long chain line, even in concealed portions and sectional views, and represent it,

- in a projection normal to the axis, by its pitch circle (external pitch circle in the case of a bevel gear and the median pitch circle in the case of a worm wheel) (see Figures 1, 2 and 3);
- in a projection parallel to the axis, by its apparent contour, extending the line beyond the gear contour on each side (see Figures 1, 2 and 3).

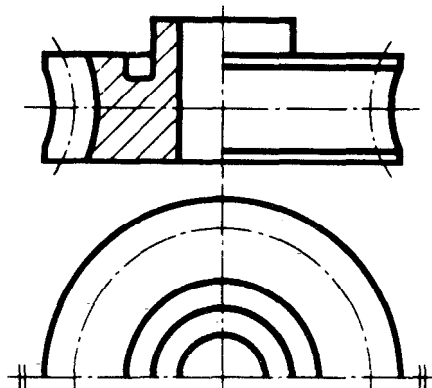


FIGURE 3

2.3 Root surface

As a general rule, do not represent the root surface except in sectional views.

However, if it seems helpful to show it also on unsectioned views, always draw it, in this case, as a thin continuous line (see Figures 4, 5 and 6).

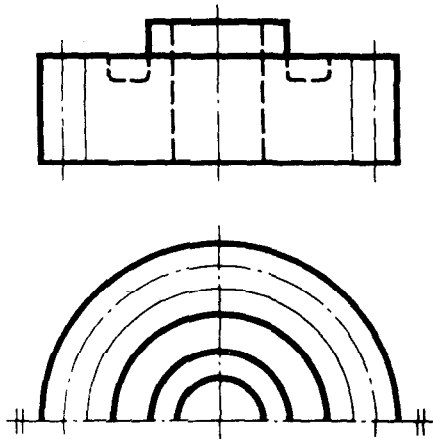


FIGURE 4

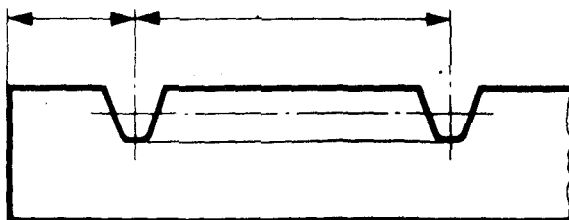


FIGURE 5

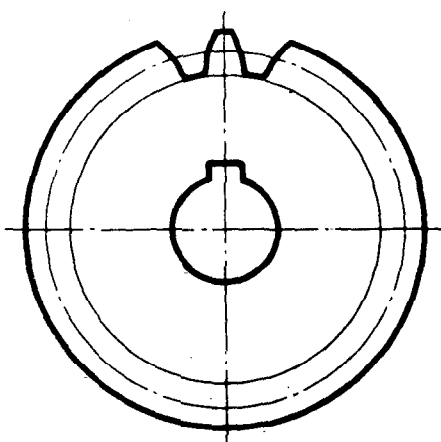


FIGURE 6

2.4 Teeth

Specify the teeth profile either by reference to a standard or by a drawing to a suitable scale.

If it is essential to show one or two teeth on the drawing itself (either to define the ends of a toothed portion or rack, or in order to specify the position of the teeth in relation to a given axial plane), draw them as thick continuous lines (see Figures 5 and 6).

It is necessary to indicate the direction of the teeth of a gear or rack on the view of the tooth surface in a projection parallel to the gear axes, three thin continuous lines of the corresponding form and direction should be shown (see Table and Figure 7).

TABLE

Tooth system	Symbol
Helical to the right	
Helical to the left	
Double helical	
Spiral	

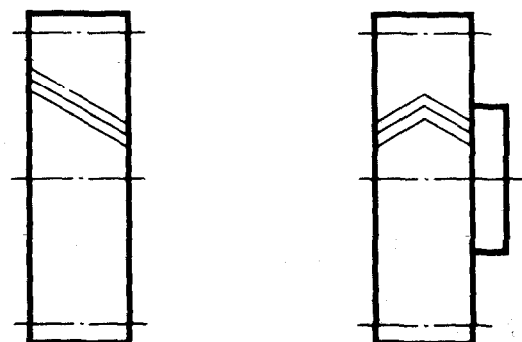


FIGURE 7

NOTE — If mating gears are represented, the direction of the teeth should be shown on one gear only.

3 ASSEMBLY DRAWINGS (GEAR PAIRS)

The specified rules for the representation of gears on detail drawings are equally applicable to assembly drawings. However, for a pair of bevel gears in projection parallel to the axis, extend the line drawn for the pitch surface to the point where the axes meet (see Figures 9 and 10).

Neither of the two gears of a gear pair is assumed to be hidden by the other in the portion in mesh (see Figure 8), except in the following two cases :

- 1) if one of the gears, the whole of which is located in front of the other, effectively conceals part of it (see Figures 9, 10 and 11);
- 2) if both gears are represented in axial section, in which case one of the two gears, chosen arbitrarily, is assumed to be partly concealed by the other (see Figure 9).

In these two cases, concealed contour edges need not be represented if they are not essential to the clarity of the drawing (see Figures 9 and 10).

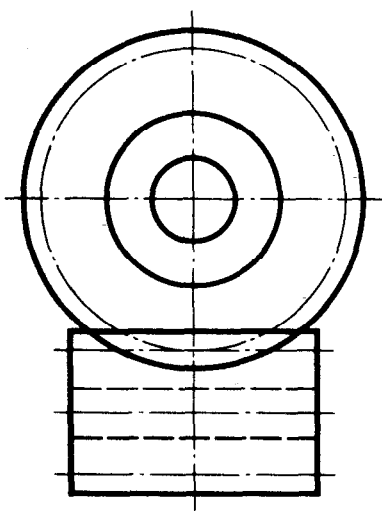


FIGURE 8

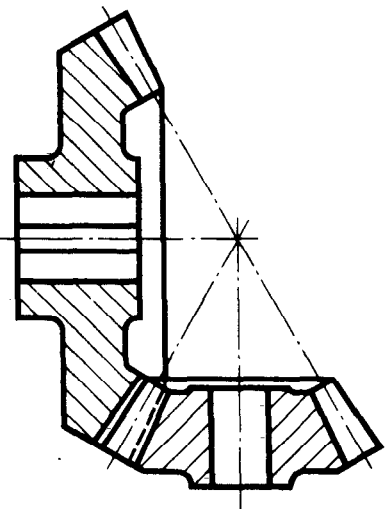
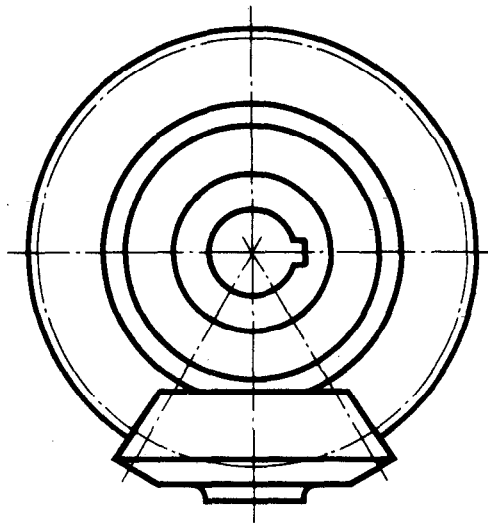


FIGURE 9

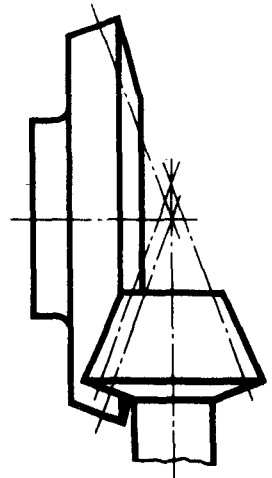
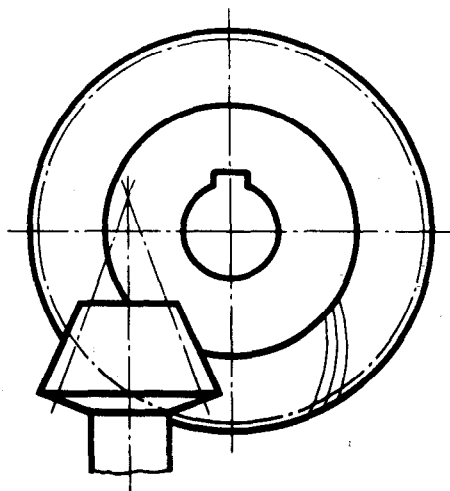
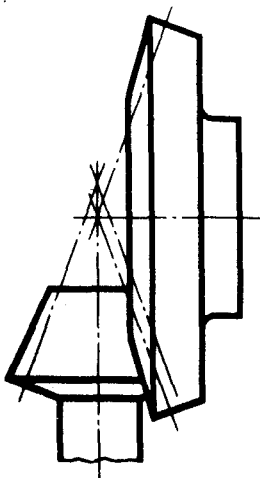


FIGURE 10

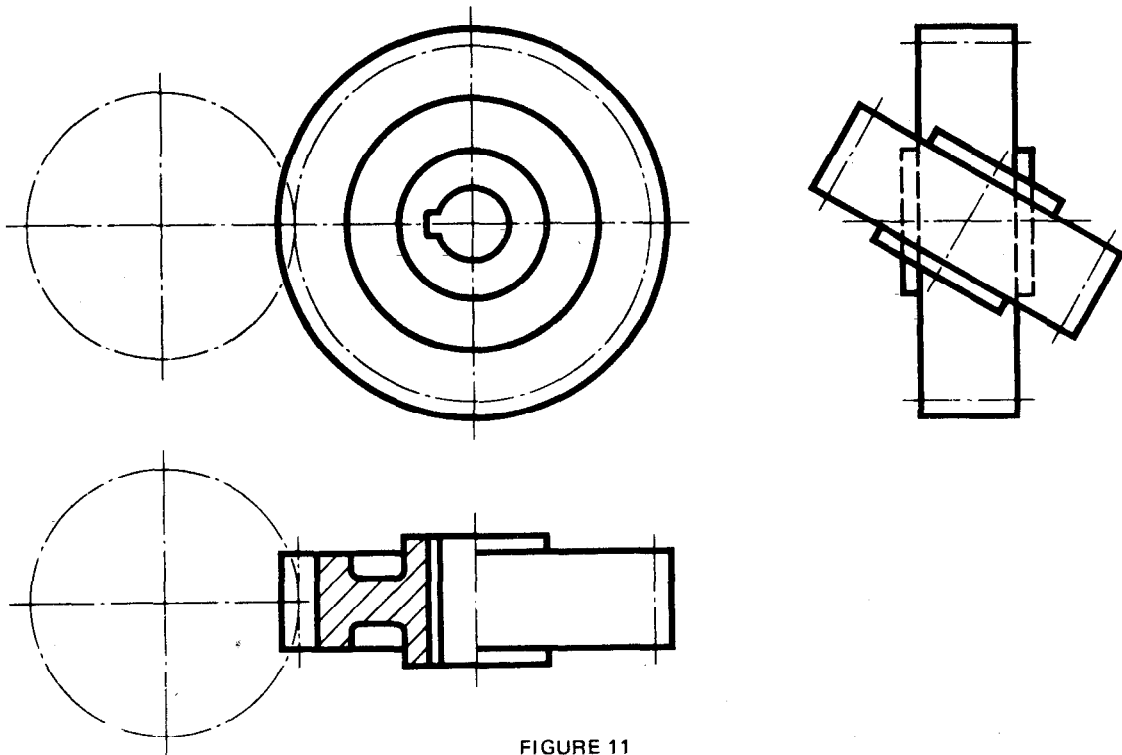


FIGURE 11

3.1 External engagement of cylindrical gears

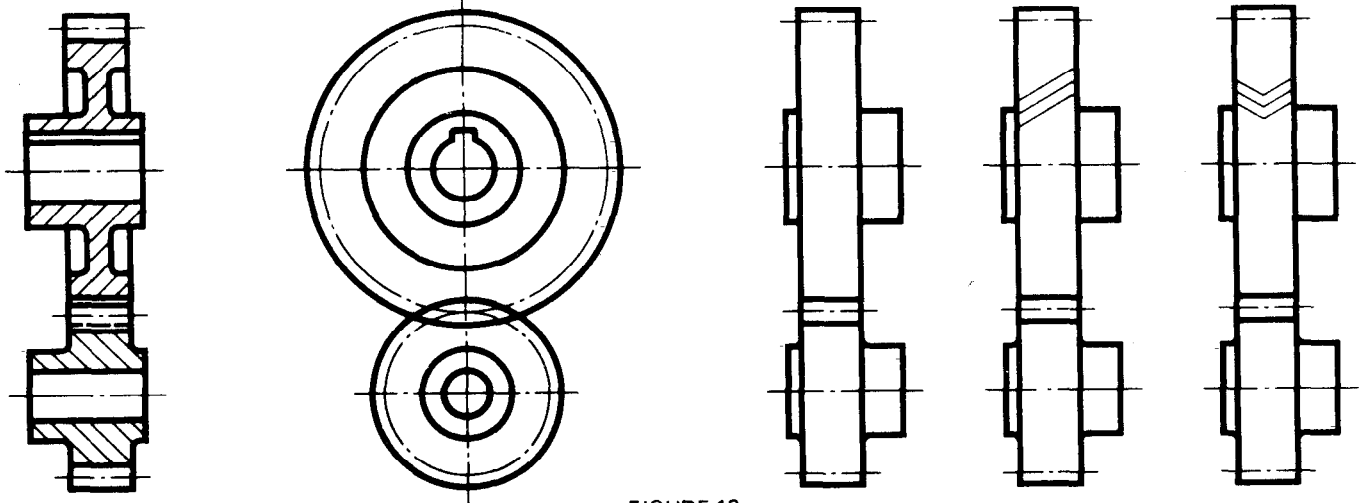


FIGURE 12

3.2 Internal engagement of cylindrical gears

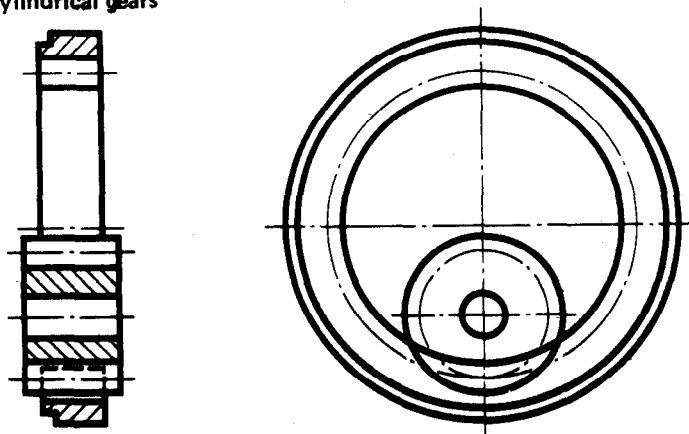


FIGURE 13

3.3 Engagement of pinion with rack

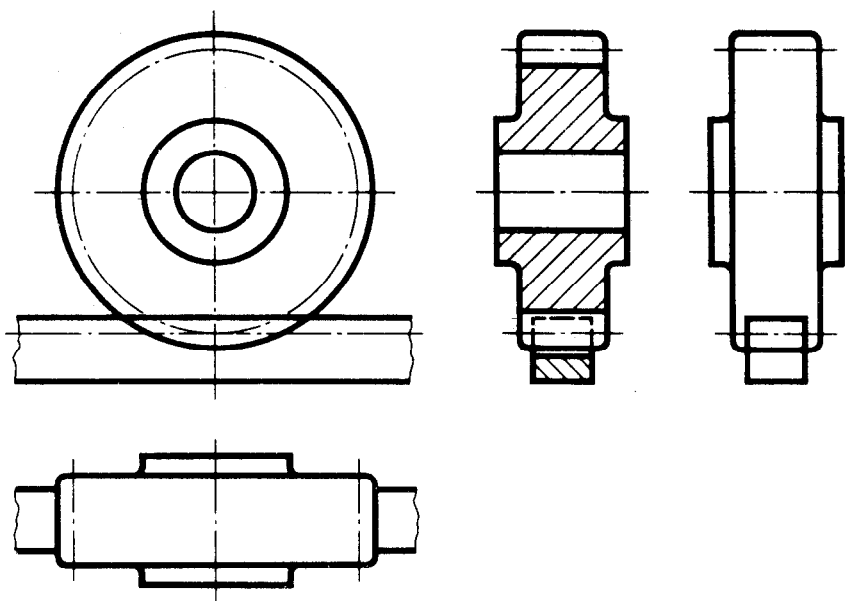


FIGURE 14

3.4 Engagement of bevel gears, axis intersection at any angle

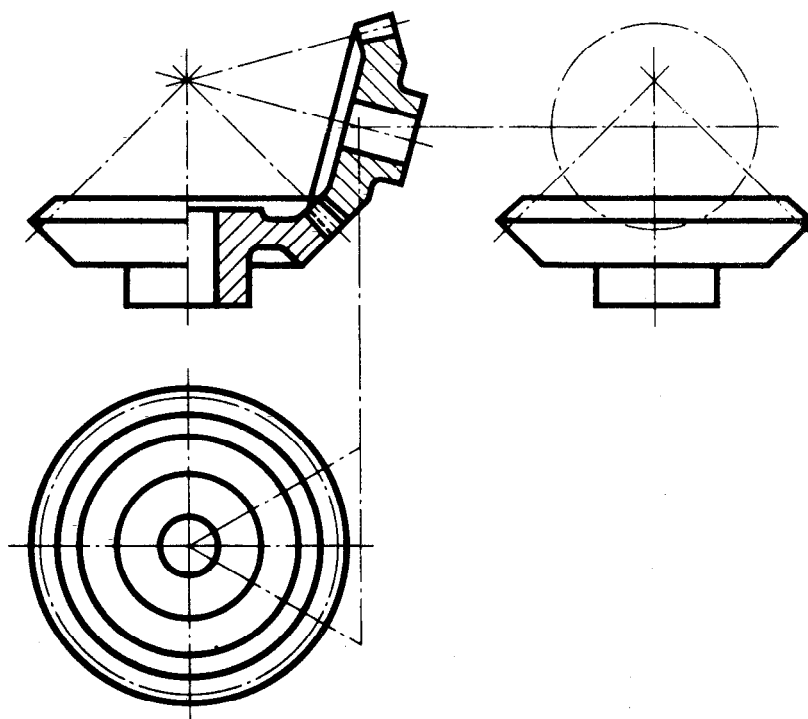


FIGURE 15

3.5 Engagement with cylindrical worm, in cross-section

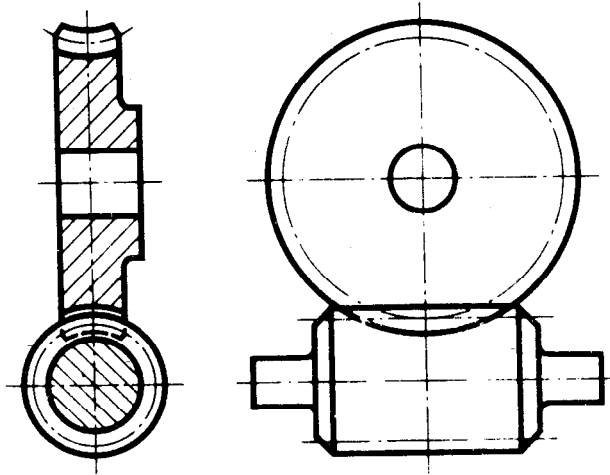


FIGURE 16

3.6 Chain wheels

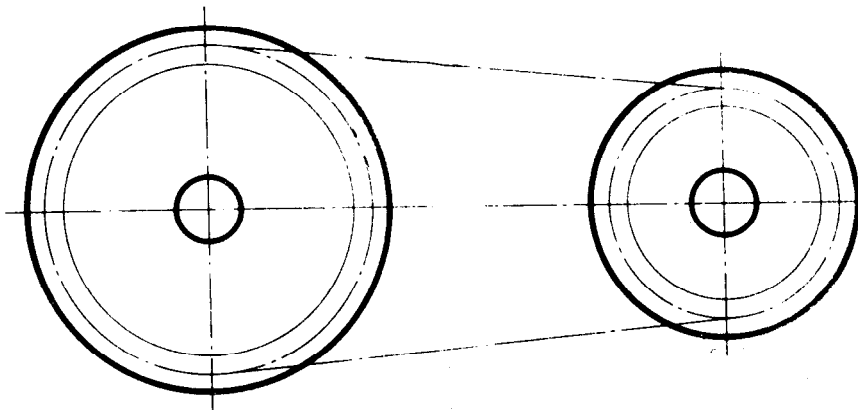


FIGURE 17